

SERVICE  
MANUAL

TT 525

**marantz®**

Model TT 525

Turntable

## FEATURES

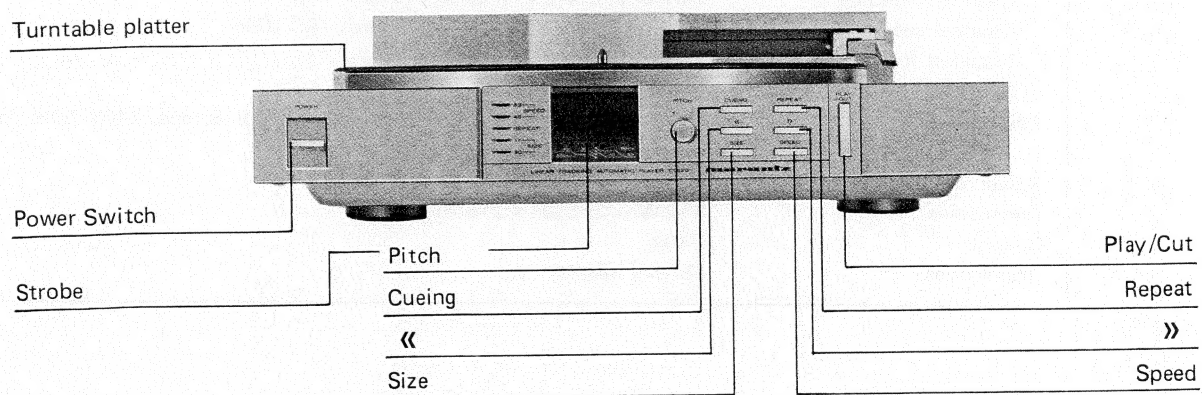
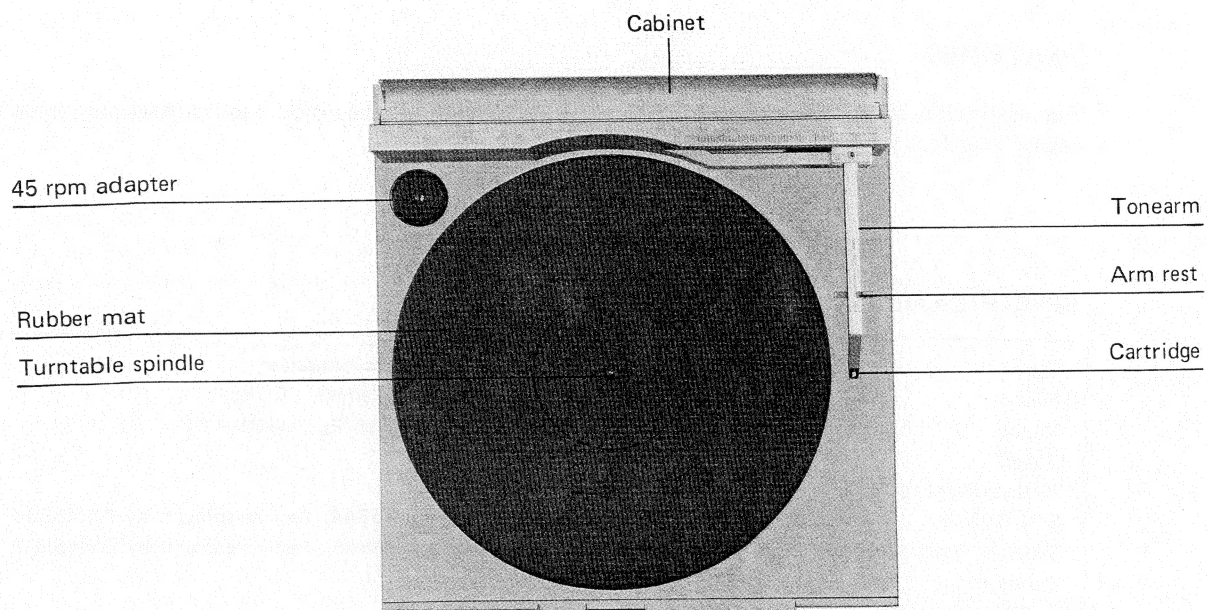
Full-automatic, direct drive linear tracking with cueing, strobe, pitch control, record size selector, speed selector, repeat, start/cut and dual suspension cabinet.

## SPECIFICATIONS

Type	2 speeds, direct drive, full-automatic turntable
Platter	Aluminum alloy die-cast, 295mm diameter, 0.7kg.
Motor	4 phase, 8 pole magnetic field which PLL coreless DC
Speed	2 speeds; 33-1/3 and 45 rpm
Pitch control range	±3% or more
S/N (DIN B)	58dB or more, Test record: DIN45544, Test equipment: by DIN45531
Wow & Flutter (DIN CCIR)	0.12% or less, Test record: DIN45545, Test equipment: by DIN45507
Tonearm	
Effective length	165±1mm
Cartridge	
Frequency response	20 - 20,000Hz
Output voltage	1.5 - 3.0mV at 1kHz, 35cm/sec, Test record: TRS-1004
Channel difference	2.5 dB or less at 1kHz, Test record: TRS-1004
Channel separation	18dB or more at 1kHz, Test record: TRS-1004
Tracking force	1.5 gram ±0.3 gram
Stylus tip	0.6mil diamond stylus
Power source	100/120/220/240V 50/60Hz, 220V 50Hz for Europe, 240V 50Hz for UK and Australia
Power consumption	10W±25%
Dimensions	350(W) x 365(D) x 118(H) mm
Weight	6.0kg
Accessories	45 rpm adaptor

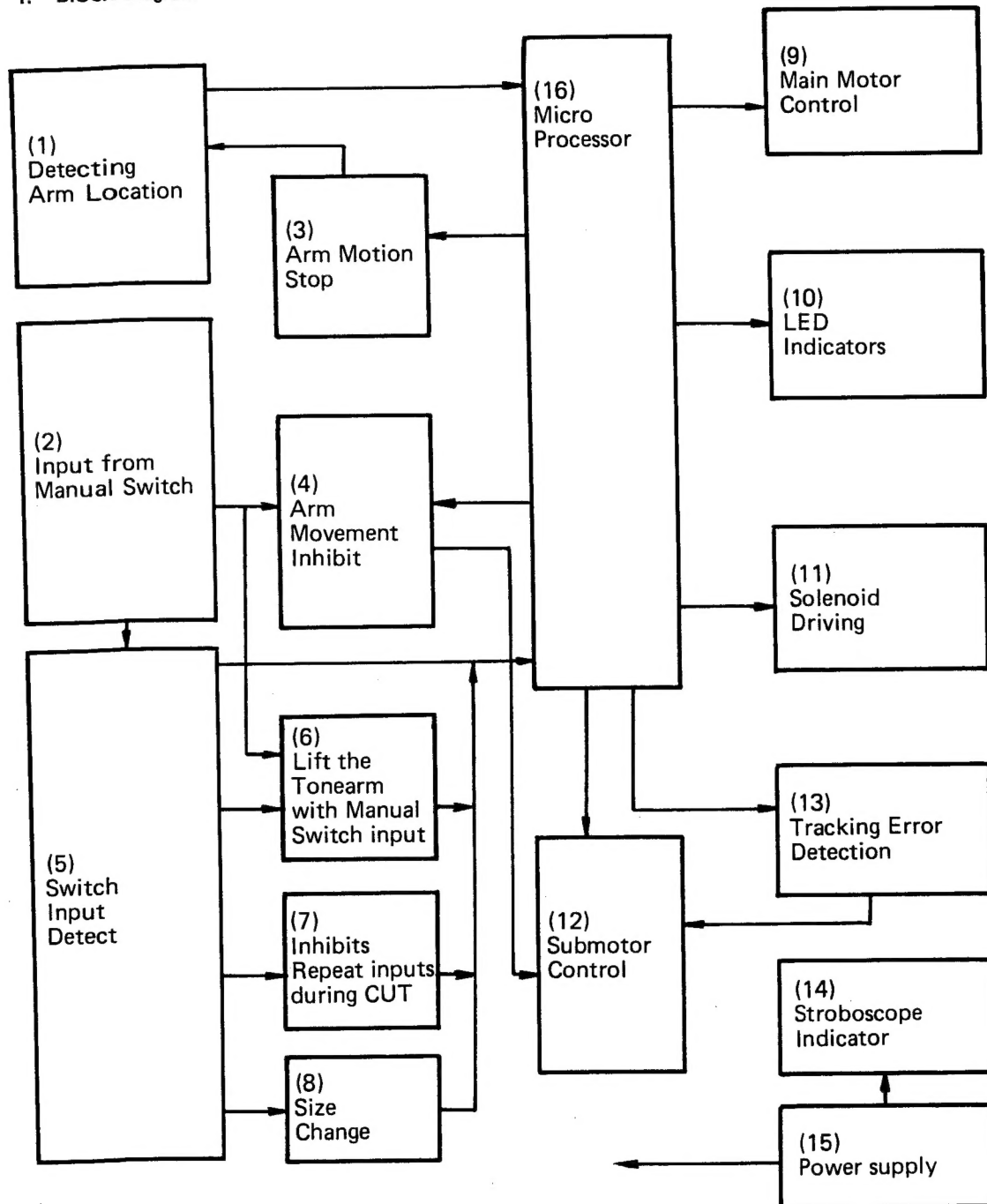
**NOTE:** Nominal Specs represent the design specs; all units should be able to approximate these-some will exceed and some may drop slightly below these specs. Limit specs represent the absolute worst condition which still might be considered acceptable; in no case should a unit perform to less than within any Limit Spec.

Lubrication of the mechanism is not required. However, whenever a unit is brought in for adjustment or repair, always use good common sense ... clean any dust or dirt from mechanical parts and if moving parts do seem to bind, check for dirt. If necessary, add a very fine film of light-weight specially formulated lubricant.



## PRINCIPLE OF OPERATION FOR CONTROL CIRCUIT

### 1. Block Diagram





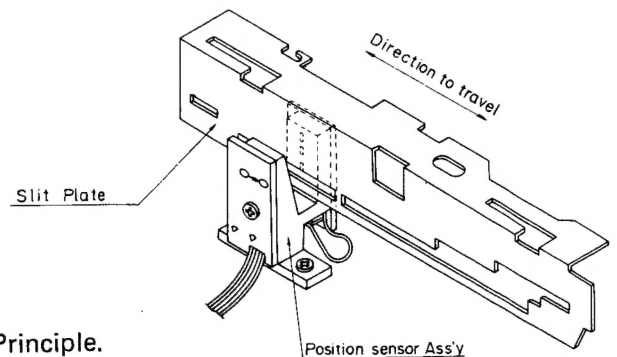
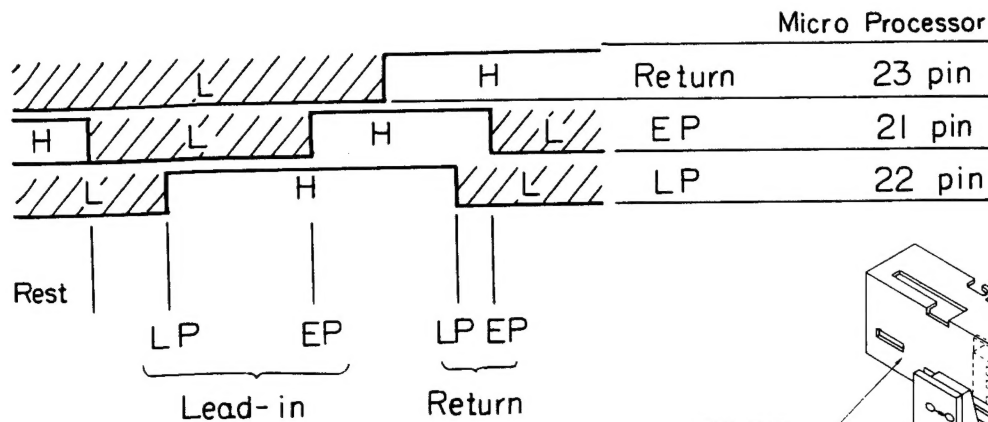
### (1) Detecting Arm Location

One LED and three photo transistors are employed to detect the arm position. As the tone arm moves, slit plate (44) moves and light from the LED falls on the photo transistor(s) in accordance with the slit on the plate. The lit photo transistor(s) conducts and send signal to microprocessor pins 21, 22 and/or 23.

For example, when the tone arm is at "rest" position, slit plate is on the rightmost position so the left side of the plate is between the LED and photo transistors. As you will see from the illustration, left side of the plate has slit in the middle height position, so the photo transistors on the middle (X119) turns on and send signal (H level) to pin 21 of microprocessor.

The combination of the level at three pins tells the microprocessor the position of tonearm as follows.

Pin 21	Pin 22	Pin 23	Tonearm Position/Movement
L	L	L	Rest to Disc
H	L	L	At rest
H	H	L	12" disc or 7" disc playing
H	H	H	Ditto
H	L	H	12" disc finishes but 7" still playing
L	H	L	12" disc starts but 7" not yet
L	L	H	Returning to rest
L	H	L	- nil -



### (2) Input from Manual Switch

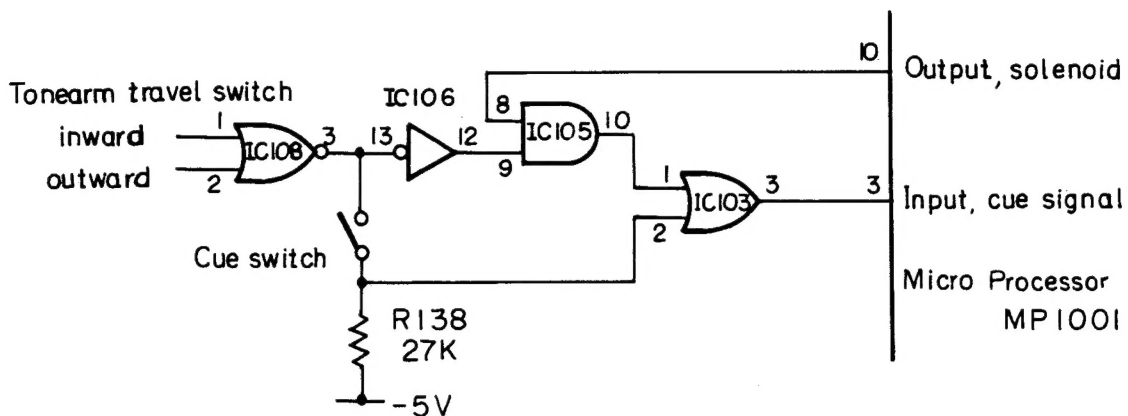
Detect signals from the manual switches. See Operation Principle.

### (3) Arm Motion Stop

When the Manual switch is pressed during automatic movement (either lead-in or return) "tone arm is at rest" signal is fed to the microprocessor and interrupt automatic operation.

When either of Manual switches is pressed, H level appears on either pin 3 or pin 4 of IC105. (Pins 1 and 5 of IC105 is H when the tonearm is lifted. See paragraph 4.) It is then ORed and applied to pin 1 of IC104. At the same time, microprocessor outputs H from either Pin 12 or Pin 13, ORed and H is applied to Pin 2 of IC104. Hence the pin 3 of IC104 goes H. It is ORed and H is applied to Pin 21 of microprocessor. The output from IC104 is also applied to inverter IC106, and resulting L is applied to one of the input of two ANDs. Thus Pins 10 and 11 of IC104 go low, pins 22 and 23 of microprocessor go low. According to the chart in para 1), this status (pin 21 = H, pin 22 = L, pin 23 = L) shows "tonearm at rest".

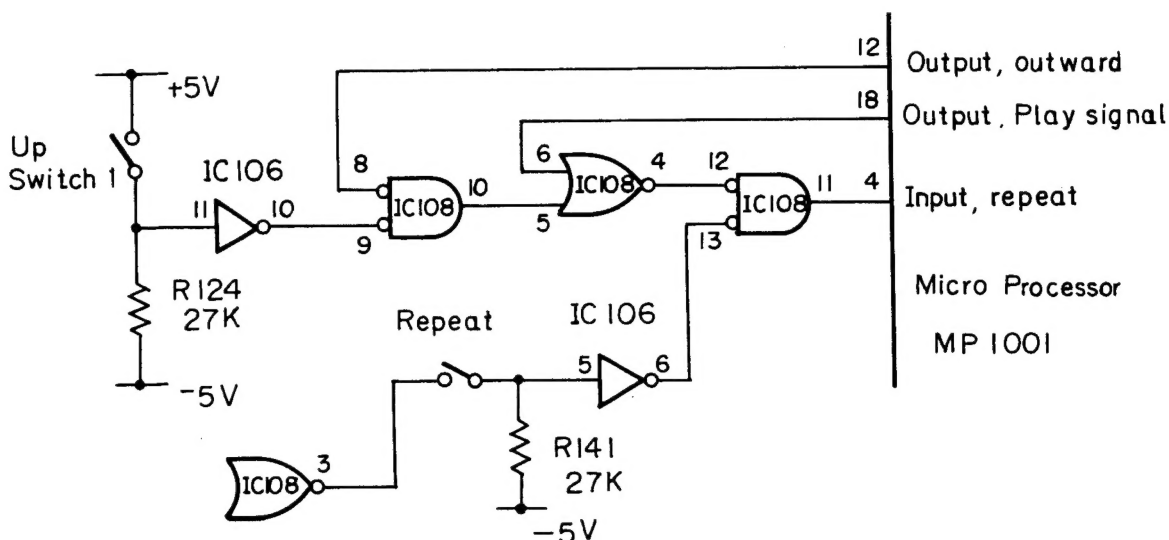




#### (7) Inhibits Repeat Inputs during CUT

During the CUT operation, the input of repeat signal is inhibited.

When the tonearm is up, the Up SW1 is on and the inverted L is applied to pin 9 of IC108. When the tonearm is moving outward way, the pin 12 of microprocessor becomes H. So, when the tonearm is up and moving outward (tonearm returning to rest), pin 10 of IC108 is L. Pin 18 of microprocessor is L when not playing the disc, thus the output from pin 4 of IC108 is H. Output of IC108 NAND becomes L and inhibits the repeat.

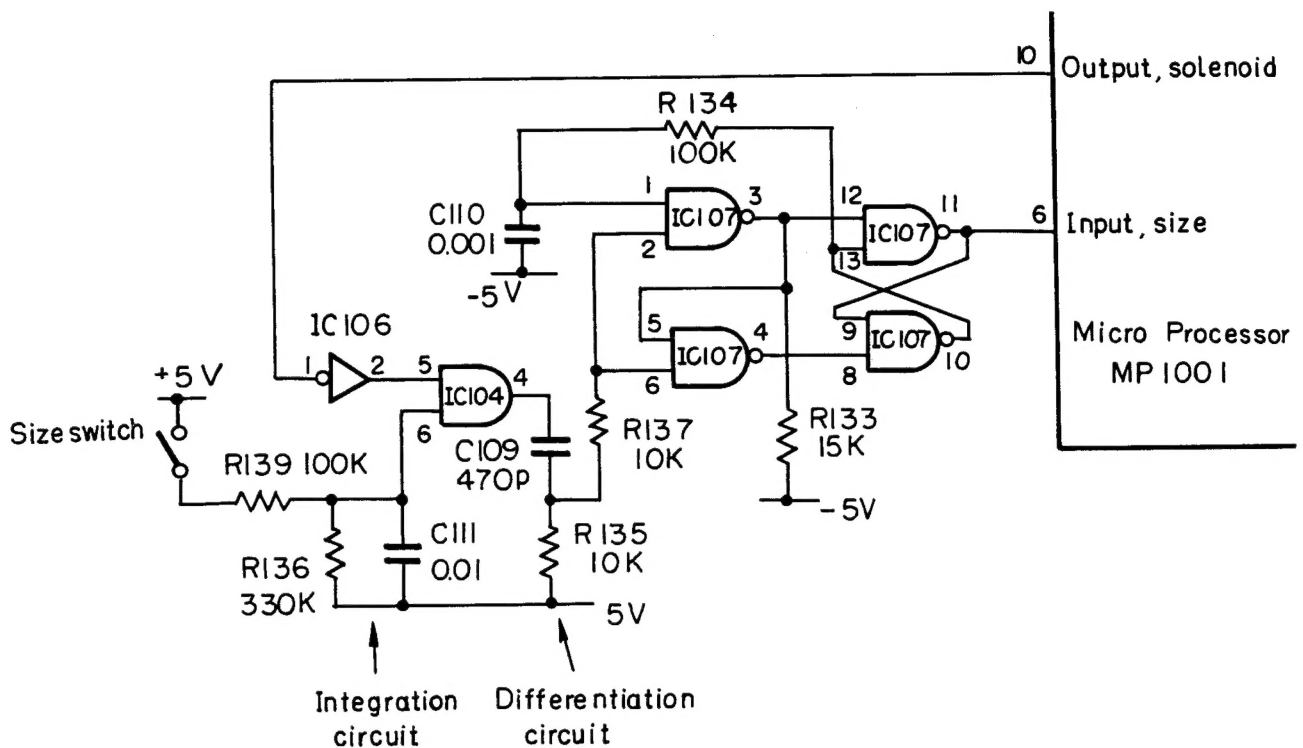


#### (8) Size Change

With the pressing of Size switch instructs microprocessor to change the lead-in position. Also interrupt size change signal when the tonearm is descended.

IC107 composes T-type flip-flop. The output level is reversed at each H input pulse. Each press of size switch reverses output level at pin 11 of IC107. (H for 12", L for 7"). R133 sets initial status at power ON (output will be H).

When the tonearm is down, the pin 10 of microprocessor is H. IC106 inverts this to L and applies to input of IC104, so even the H pulse comes from Size switch, the output of IC104 is kept low and size change signal is not applied to microprocessor.

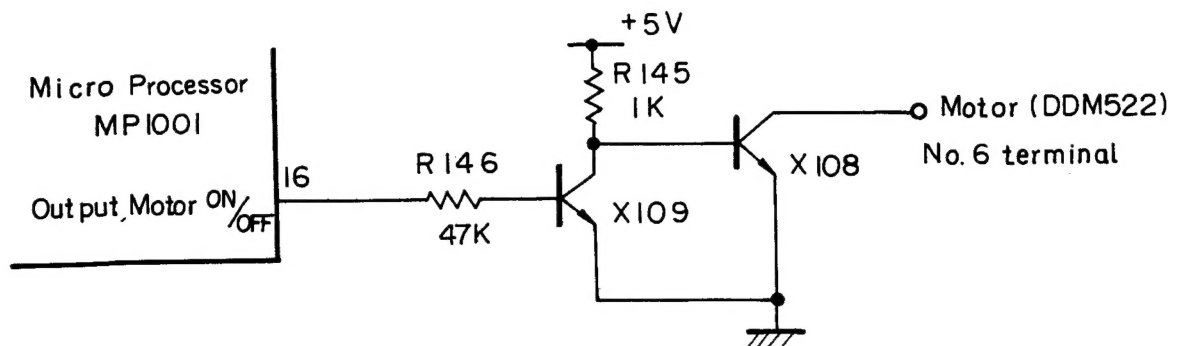


### ( 9 ) Main Motor Control

To setup ON/OFF and rotary speed by means of output level of MP1001.

#### 1. ON/OFF Control:

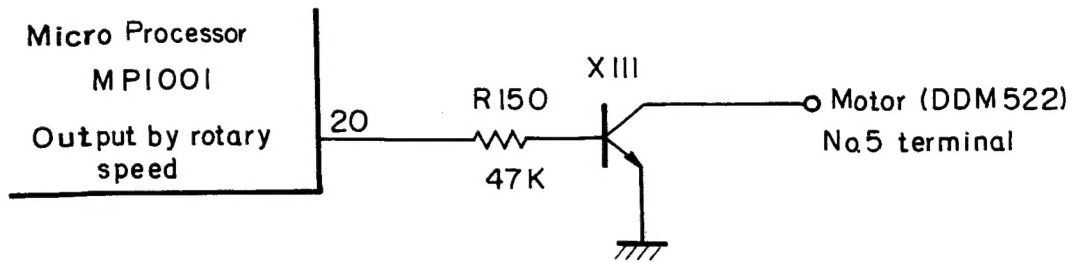
Motor stops when the terminal 6 of motor control board is grounded. Pin 16 of microprocessor is H when motor needs to be rotate. X109 turns on and X108 turns off. When pin 16 goes L, X109 turns off and X108 turns on, then the terminal 6 is grounded.



#### 2. Speed Control:

When the terminal 5 of motor control board is grounded, the revolution becomes 45 rpm. For 45 rpm, pin 20 of microprocessor becomes H, X111 turns on and terminal 5 is grounded.



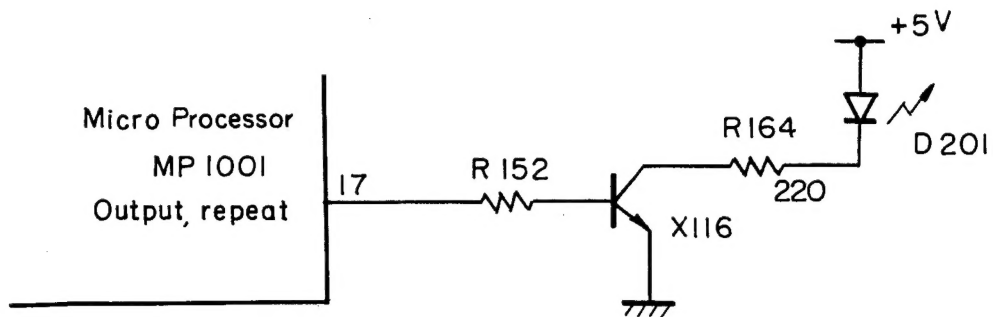


#### (10) LED Indicators

Switches LED indicators on and off.

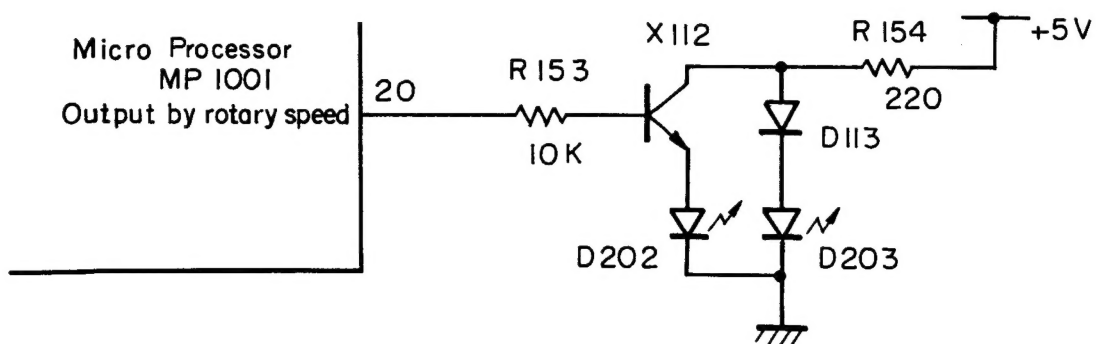
##### 1. Repeat Indicator:

Pin 17 of microprocessor becomes H when repeat is effective, and turns X116 on.



##### 2. Speed Indicator:

Pin 20 of microprocessor becomes H for 45 rpm (see paragraph 9). X112 turns on and D202 lights. For 33 rpm, Pin 20 is L and X112 is off, so D203 lights.



##### 3. Size Indicator:

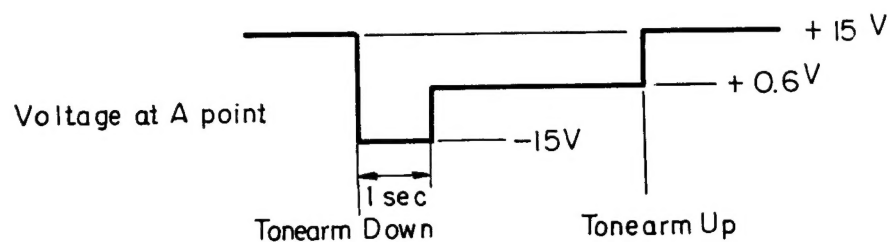
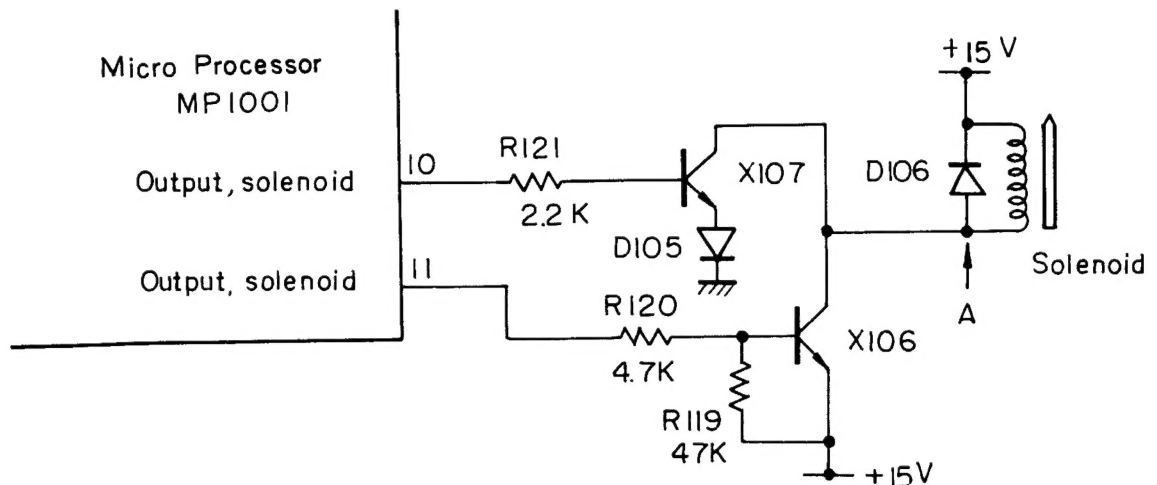
Per paragraph 8), H is applied to pin 6 of microprocessor. The same H signal is applied to X113 and turns D205 on. When L is applied for 7", X113 turns off and D204 lights.

### (11) Solenoid Driving

Energizes solenoid to descend the tone arm.

When tonearm needs to be pulled down, both pins 10 and 11 of microprocessor becomes H. X106 turns on and 30V is applied to solenoid, pulling down the tonearm. (X107 is off in this state: collector voltage is lower than emitter voltage.)

In one second, pin 11 becomes low and X106 turns off, X107 turns on and 15V is applied to solenoid, keeping tonearm at down position.



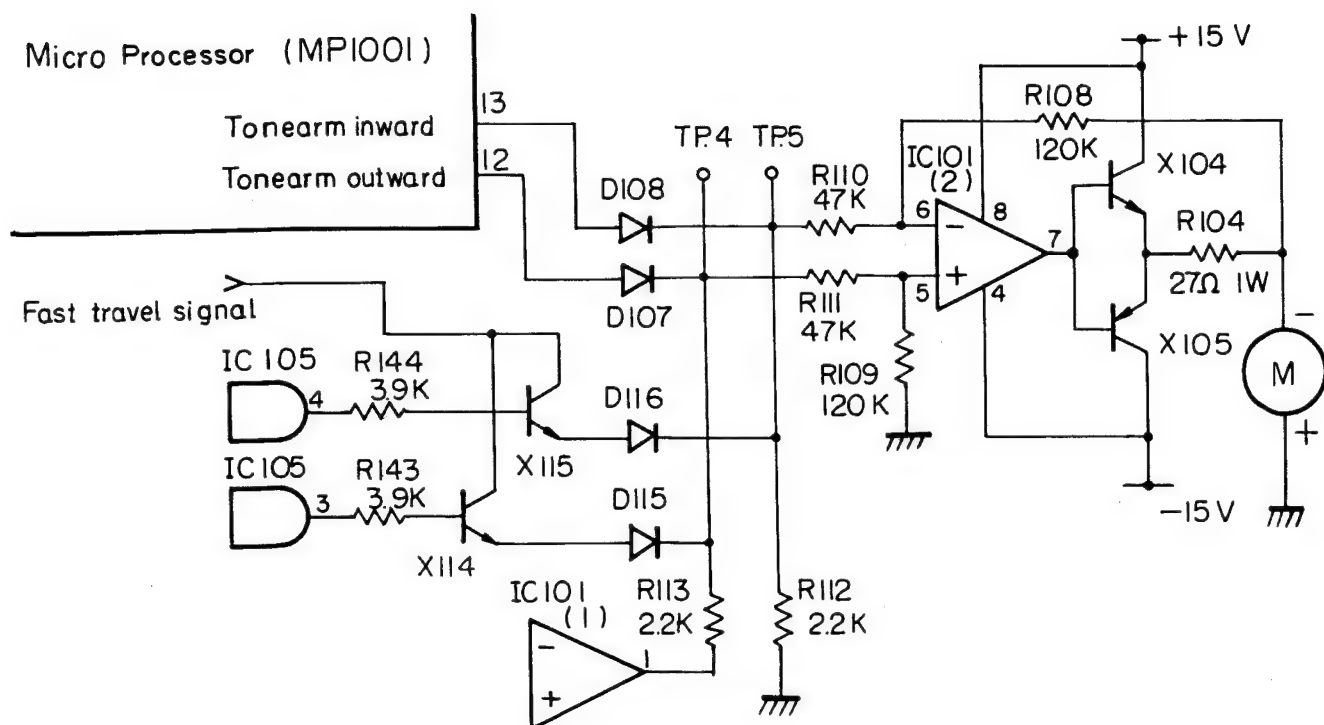
### (12) Submotor Control

Controls direction and speed of submotor (tonearm driving motor) according to the signal from the microprocessor, manual switch or tracking error detection circuit (see paragraph 13).

When the voltage at TP4 is higher than at TP5, IC101(2) acts as non-inverting amplifier and motor rotates to move tonearm outward. When TP5 voltage is higher, IC101(2) acts as inverting amplifier and motor rotates in reverse way.

When the Pin 13 of microprocessor is H (+5V), voltage at TP5 becomes about 4.4V, and approximately -10V is applied to the motor. When the Pin 12 of microprocessor is H, +10V is applied.

When either of Manual switch is pressed, one of the IC105 output becomes H. If Fast travel signal is not applied (no collector voltage) X115 or X116 acts like diode, and as the result of voltage drop across the X115(X116), TP5(TP4) voltage becomes about 1.4V. The voltage to the motor is about -4V (+4V). When Fast travel signal is H, TP5(TP4) voltage becomes 4.4V (voltage drop of D116(D115) only) and tonearm will move faster due to higher voltage to the motor.



### (13) Tracking Error Detection

Detects the slant of tonearm with photo-sensor and corrects the error. The pitch between each groove of disc is not uniform. Soft passage will have smaller groove while on the peak of music the groove will be larger/deeper. This circuit is to detect the pitch of groove and move tonearm so the stylus descends on the groove perpendicular. When tonearm is in up position, this circuit is deactivated.

When tonearm slants inward, light to the photo-sensor increase and voltage at point A becomes high: When slanted outward, light decrease and voltage becomes low. VR101 adjust the sensitivity of photo sensor: it should be adjusted so the tonearm slant to inward at maximum makes the voltage at point A almost saturated.

IC101 acts as inverter (the gain is 0dB) and conveys error signal to submotor controlling circuit. D111/D112 is to weaken the sensitivity of sensor when the tonearm is in the center correct position. D110/D119 apply bias to IC101 output for about 0.6V.

When the voltage at point A increases, the output of IC101 decreases, TP4(see schematic on previous paragraphs) voltage goes low and tonearm moves inward to correct inward slant. Similarly, when tonearm slants outside tonearm moves outward.

The tracking error calibration circuit is disabled when:

- (1) Tonearm is in up position (pin 10 of microprocessor is L and IC106 output is H).
- (2) Tonearm is descending to the disc (either Up SW2 is on or pin 11 of microprocessor emits H signal).

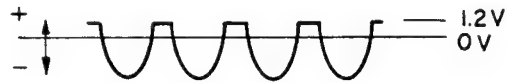
In each case, H is applied to base of X117, making it conducts. The gate of FET X118 goes low and error signal is not conveyed to the IC101.





R106 and R107 divide the voltage applied across these. And the voltage at point B will be:

Wave form at point B.



When the voltage at B exceeds 1.2V, X101 turns on and lights LEDs. LEDs light up the stroboscope under the turntable platter, and reflected the stroboscope mirror.

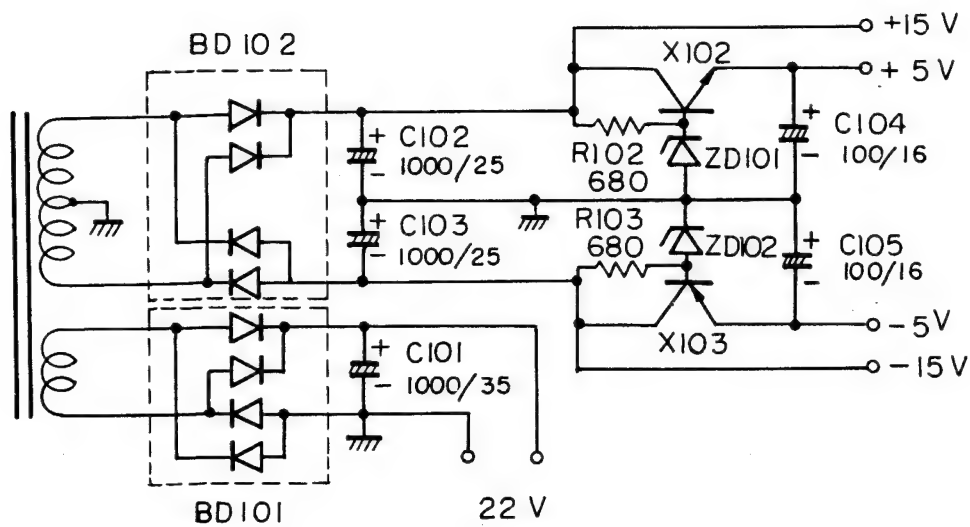
#### (15) Power Supply:

Generates three DC power source:

+/- 15V for IC101, submotor drive and solenoid drive

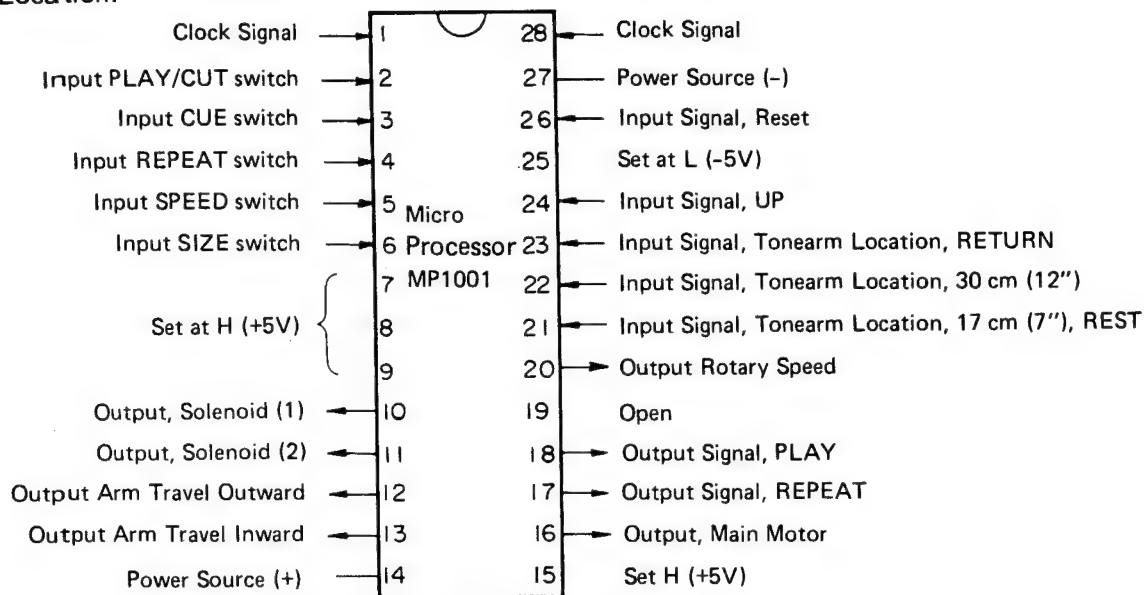
+/- 5V for logic circuit

22V for main motor drive



## (16) Micro Processor

### 1. Pin Location:



All of the terminals are open drain.

### 2. Function of Pins:

#### 1) Clock:

Clock input signal of microprocessor and oscillation frequency is about 400 kHz.

#### 2) Input, PLAY/CUT switching:

Input level H (+5V) is accepted as PLAY signal at the rest position, also is accepted as CUT signal at position other than rest.

#### 3) Input, CUE switching:

Input H (+5V) signal is accepted as UP, DOWN signal by pressing CUE button. But signal is interrupted when tonearm is at the rest position or in motion.

#### 4) Input, REPEAT switching:

Input H (+5V) is accepted as REPEAT ON, or REPEAT OFF signal by pressing repeat button.

#### 5) Input, SPEED switching:

Input H (+5V) is accepted as speed change signal by pressing speed change button.

#### 6) Input, SIZE switching:

Input H (+5V) is read as 30 cm (12") and H (-5V) is read as 17 cm (7"), but the signal is accepted only when the tonearm is traveling from the tonearm rest to lead-in point to start play.

7, 8, 9) No. 7, 8 and 9 are optional pins, not used and set at H (+5V).

#### 10) Output (1), Solenoid:

To feed H (+5V) signal for tonearm down motion, and is opened for tonearm up motion.

#### 11) Output (2), Solenoid:

To feed H (+5V) signal for only initial 1 sec., for the tonearm down motion, and it is opened in other mode.

12) Output, Arm Travel Outward:

To feed H (+5V) signal for outward travel of tonearm in automatic mode, and also to feed H (+5V) as BRAKE signal to interrupt inward travel of the tonearm and at tonearm down motion.

13) Output, Arm Travel Inward:

To feed H (+5V) signal for inward travel of tonearm in automatic mode, and also to feed H (+5V) as BRAKE signal to interrupt outward travel of the tonearm and at tonearm down motion.

14) Power Source (+):

±5V is used as 10V power source.

15) No. 15 is optional pin, not used and the level is set at H (+5V).

16) Output, Main Motor ON/OFF:

To feed H (+5V) signal when PLAY input is applied and the tonearm is located other than at the rest position.

17) Output Signal, REPEAT:

To feed H (+5V) signal for REPEAT ON, and it is opened for REPEAT OFF.

18) Output Signal, PLAY:

To feed H (+5V) signal when the tonearm leaves the rest position, but it is opened for CUT mode.

19) No. 19 is optional pin, not used and opened.

20) Output Rotary Speed:

To feed H (+5V) for 45 rpm, and it is opened at 33 rpm.  
Initial level of the signal is opened for 33 rpm.

21, 22, 23) Input Signal, Tonearm Location:

Same function as 2-1).

24) Input Signal, UP:

To read completion of tonearm lift motion by H (+5V) input signal.

25) No. 25 is optional pin, not used and set at L (-5V).

26) Input Signal, Reset:

To recover output signal to initial level by H (+5V) input signal.

To reset all modes to initial mode by input signal of H (+5V).

Initial mode means that the tonearm is located at the rest position and speed is 33 rpm.

27) Power Source (-):

±5V is used as 10V power source.

28) Clock Signal:

Clock input signal of microprocessor and oscillation frequency is about 400 kHz.

3. Rating:

Power Source: 10V ± 10%

Input Terminal: H -- 8V or more  
L -- 5.7V or less

Output Terminal: Open drain, but provides additional PULL-DOWN resistors to the terminals.

## ADJUSTMENT:

### 1. Adjustment of Lead-in position.

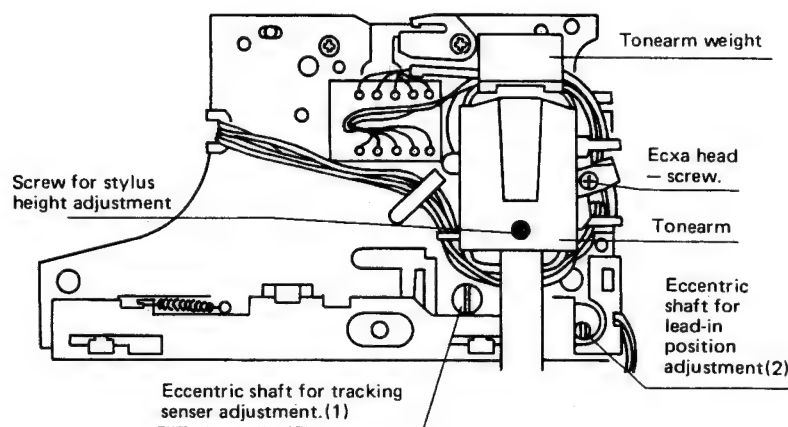
The Tonearm should perform lead-in motion and descend at 12" position by pushing the PLAY switch ON after setting SIZE Selector to 12".

To change the descending position, adjust Eccentric Shaft(2) on Tonearm Base so that lead-in descend position occurs within the following tolerances.

12" Descending position 11.50-11.69in./292-297mm.(from Main Motor shaft) 7" Descending position 6.57-6.77in./167-172mm.

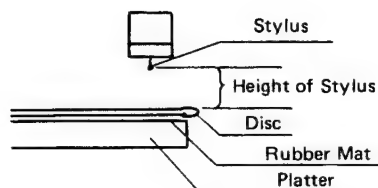
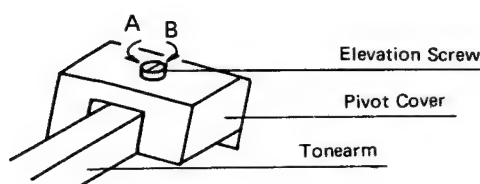
The 7" lead-in position is fixed by the adjustment for 12", automatically.

(Lead-in position moves gradually outward by rotating the Eccentric Shaft(2) in a clockwise direction).



### 2. Adjustment of Stylus height.

Adjust height of Stylus within 4-7mm from surface of Disc at lead-in and return motion by turning Elevation Screw. The screw for Stylus adjustment is located on Tonearm Pivot Cover.



When height of Stylus is too low, turn Elevation Screw counter-clockwise (direction of arrow A); when it is high, turn it clockwise (direction of arrow B).

### 3. Adjustment of Motor.

VR3 is to be set 2.5 K ohm.

EP adjustment is to be done by VR1 (20 K ohm).

LP adjustment is to be done by VR2 (50 K ohm).

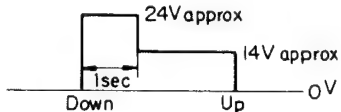
And then when VR3 is changed from 0 to 5 K ohm, range of adjustment for LP and EP is to be more than  $\pm 3.5\%$ .



## TROUBLE SHOOTING GUIDE

Symptom	Cause	Procedure
LEDs D123, D124 for strobe do not turn ON.	<ol style="list-style-type: none"> <li>1. Power Transformer is defective.</li> <li>2. Fuses has blown.</li> <li>3. Diode D101 is defective.</li> <li>4. LEDs D123, D124 are defective, or Transistor X101 is defective.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check the voltage between terminals 3 and 5 of CNP 101. If 23V AC is not observed, replace transformer.</li> <li>2. Check fuses 102 and 103. above. Replace fuse(s).</li> <li>3. Check the voltage between terminals TP7 and 6 or CNP 108. If DC voltage is not observed, replace diode.</li> <li>4. Check the voltage between both terminals of both LEDs. If pulse voltage is observed, replace LEDs, if it is not observed, replace transistor X 101.</li> </ol>
<p><b>Play/Cut</b></p> <p>a) Tonearm does not move.</p>	<p>a) 1. Position Sensor Ass'y is defective.</p> <p>2. Sub Motor is defective.</p> <p>3. Transistor X104, X105 are defective.</p> <p>4. IC 101 is defective.</p>	<p>a) 1. Check voltage between the following points. TP7 and 42 of CNP105: should be 5V TP7 and 43 of CNP105: should be -4V TP7 and 44 of CNP105: should be -4V TP7 and 45 of CNP105: should be 3.8V If any of the voltages are not observed, replace Position Sensor Ass'y.</p> <p>2. Check voltage between terminals 39 and 40 of CNP107. If 10V DC is observed, replace Sub Motor.</p> <p>3. Check voltage between Base and Emitter of Transistors X104 and X105. If 0.6V DC is not observed, replace Transistor(s).</p> <p>4. Check voltage between terminals TP7 and 13 of IC 102. If 5V DC is observed, replace IC 101.</p>

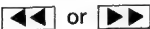
Symptom	Cause	Procedure
<b>Play/Cut (continued)</b>  a) Tonearm does not move.	5. Play/Cut Switch is defective.  6. Movement of Linear Tracking Carrier Mechanism is stiff.	5. Check voltage between terminals TP7 and 2 of IC 102 with pushing Play/Cut Switch. If 5V DC is observed, replace IC 102. If other than 5V DC, replace Switch. 6. While pushing Pulley Holding Plate Ass'y to release tension of Wire Belt, check Carrier Mechanism for smoothness of movement. Check routing for lead wire interference with Carrier Mechanism Movement. Check Guide Bar. Replace if deformed, dented, nicked.
b) Tonearm returns to rest position during lead-in motion.	b) 1. Position Sensor Ass'y is defective.  2. Improper adjustment of Tracking Sensor.  3. Movement of Linear Tracking Carrier Mechanism is stiff.	b) 1. Check as specified in item a) 1.  2. Place Tonearm on its rest, and check voltage between terminals TP7 and TP3. Voltage should be $0 \pm 0.6V$ , if not, Adjust position of Tracking Sensor Ass'y. 3. Check as specified in item a) 6.
c) Tonearm does not descend to Disc.	c) 1. Leaf Switch (UP SW1) is defective.  2. Solenoid is defective.	c) 1. Contacts of Leaf Switch (UP SW1) should be closed when Power Switch (SW201) is OFF and Tonearm is UP. Check voltage between terminals TP7 and 35 of CNP 106; voltage should be 5V; if -5V is observed, contacts of Leaf Switch are not closed. 2. Press Play/Cut Switch (SW202) ON while monitoring voltage between 32 and 33 of CNP106.


Symptom	Cause	Procedure
<b>Play/Cut (continued)</b>  c) Tonearm does not descend to Disc. (continued)		<p>As Tonearm descends, voltage should change from 24V, after 1 sec, to 14V (approx) and voltage should remain at 14V during Disc play (cue down).            When Tonearm is at rest position (Cue UP), voltage should be 0V.</p> 
	3. Improper Solenoid stroke adjustment.	3. Adjust stroke of Solenoid.
	4. Improper adjustment of clearance between Elevation Lever and Elevation Spindle.	4. Re-install Elevation Lever so the proper clearance between Elevation Lever and Elevation Spindle is obtained.
<b>Repeat</b>  Repeat LED does not turn ON.	1. LED (D201) is defective.  2. Transistor X116 or IC 102 is defective.	1. Check voltage between terminals 23 and 27 of CNP 104; if voltage changes by pushing Repeat Switch, replace LED. 2. Check voltage between terminals TP7 and 17 of IC 102. If 5V DC 9s observed, replace X116. If other than 5V DC, replace IC 102.

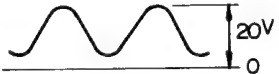
Symptom	Cause	Procedure
<p><b>Horizontal</b></p> <p>Horizontal movement is intermittent or non-existent.</p>	<p>1. Sub motor is defective.</p> <p>2. Adjustment of Tracking Sensor Ass'y is not in good condition.</p> <p>3. Transistors X104, X105 are defective.</p> <p>4. IC 101 is defective.</p> <p>5. Manual Search Switch or IC 105 is defective.</p>	<p>1. Check voltage between terminals 39 and 40 of CNP 107 while pushing Manual Search Switch. Voltage readings will be determined by speed of Tonearm movement selected and direction (in relation to Main Motor shaft).</p> <p>Fast inward: More than -10V Slow inward: More than -3V Fast outward: More than +10V Slow outward: More than +3V.</p> <p>If Sub motor does not rotate in spite of even when above voltages are observed, replace Sub motor.</p> <p>2. Check as specified in item b) 2 of Play/Cut.</p> <p>3. Check as specified in item a) 3 of Play/Cut.</p> <p>4. Check voltage between terminals TP7 and TP4 or TP5 while pushing Manual Search Switch.</p> <p>Fast inward: TP7 – TP5: 4.4V Slow inward: TP7 – TP5: 1.4V Fast outward: TP7 – TP4: 1.4V Slow outward: TP7 – TP4: 1.4V</p> <p>If above voltage are observed, replace IC 101.</p> <p>5. Check voltage between terminals TP7 and 24, 25 or 26 of CNP 104 while pushing Manual Search Switch.</p> <p>Fast inward: TP7 – 24, 25: 5V Slow inward: TP7 – 25: 5V Fast outward: TP7 – 24, 26: 5V Slow outward: TP7 – 26: 5V</p> <p>If above voltage are observed, replace IC 105.</p> <p>If above voltages are not observed while pushing Manual Search Switch, replace Switch.</p>

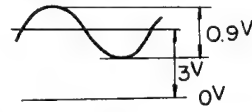


Symptom	Cause	Procedure
<p><b>Size</b></p> <p>a) Record Size Selector is does not function.</p> <p>b) Size Select Indicator(s) (LED) do not turn ON.</p> <p><b>Speed</b></p> <p>a) Speed Selector does not function or Speed Select Indicator(s) (LED) does not turn ON.</p> <p>b) Speed Select indicator (LED) does not light.</p>	<p>a) 1. Tonearm is in Down position.</p> <p>2. IC 107 or Size Selector Switch is defective.</p> <p>b) LED(s) (D204 for 17 cm, D205 for 30 cm) is defective.</p> <p>a) 1. IC 102, Speed Selector Switch (SW205), Transistor X111, LED(s) (D202 for 45 rpm, D203 for 33 rpm) or Motor is defective.</p> <p>2. IC 102, Speed Selector Switch is defective.</p> <p>b) LED(s) is defective.</p>	<p>a) 1. Make sure that Tonearm is in UP position.</p> <p>2. Check voltage between terminals TP7 and 19 of CNP 103.</p> <p>If 5V DC is observed while pushing Size Selector Switch, replace IC 107.</p> <p>If 5V DC is not observed, replace Size Selector Switch.</p> <p>b) Check voltage between terminals TP7 and 6 of IC 101.</p> <p>If voltage changes -5V, +5V alternately when Size changes (LED does not change), replace LED(s).</p> <p>If voltage does not change, check as specified above.</p> <p>a) 1. Check voltage between terminals TP7 and 20 of IC 102.</p> <p>If voltage changes 5V, 0V alternately when speed changes, replace LED(s); if it changes and Indicator (LED) changes but motor speed does not change, replace transistor X111.</p> <p>If voltage does not change, replace IC 102 or Speed Selector Switch.</p> <p>Connect TP7 and 7 of CNP 102; if motor speed changes to 45 rpm, replace Transistor X111; if it does not change, replace Motor.</p> <p>2. Check voltage between terminals TP7 and 18 of CNP 103.</p> <p>If 5V DC is observed while pushing Switch, replace IC 102; if other than 5V, replace Switch.</p> <p>b) Check and replace.</p>

Symptom	Cause	Procedure
<b>Other defects</b>  1. LED is dimly lit. 2. Strobe is dimly lit when ON. 3. Horizontal movement control button is jamming.          4. No output from Cartridge only. L and R channel reversed. 5. Strange sound when Cartridge descends. 6. Strange sound from Main Motor.  7. Stylus cannot touch Disc with Cue down.  8. Stylus bounces on Disc after Tonearm descends. 9. Tonearm base moves left or right after Tonearm descends. 10. No Auto return.  11. Stylus scratches Disc surface with cue up or during return to Tonearm Rest.	1. LED lights dimly. 2. Fuse 102 has blown. 3. Button touches edge of opening in Plastic Base.   4. Cartridge is defective. Improper connection of Lead Wires. 5. Amount of silicon oil on Solenoid shaft is not enough. 6. Foreign matter stuck on Motor magnet. 7. Stylus height is set too high.  8. Improper vertical movement of Elevation Plate. 9. Improper adjustment of Tracking Sensor.  10. Movement of Linear Tracking Carrier is stiff.  11. Slackness in Elevation Plate.	1. Straighten by hand. 2. Replace. 3. Adjust installation of button and check clearance between the opening and both sides of button (should be 1mm).          4. Replace the Cartridge Ass'y.  5. Put silicon oil on Solenoid shaft.  6. Remove.  7. Adjust Stylus height as described in Adjustment of Stylus height. 8. Replace Elevation Plate.  9. Check Tracking Sensor as described in item b) 2. of Play/Cut. 10. Check movement of Carrier Mechanism as described in item a) 6. of Play/Cut. 11. Replace Elevation Plate.

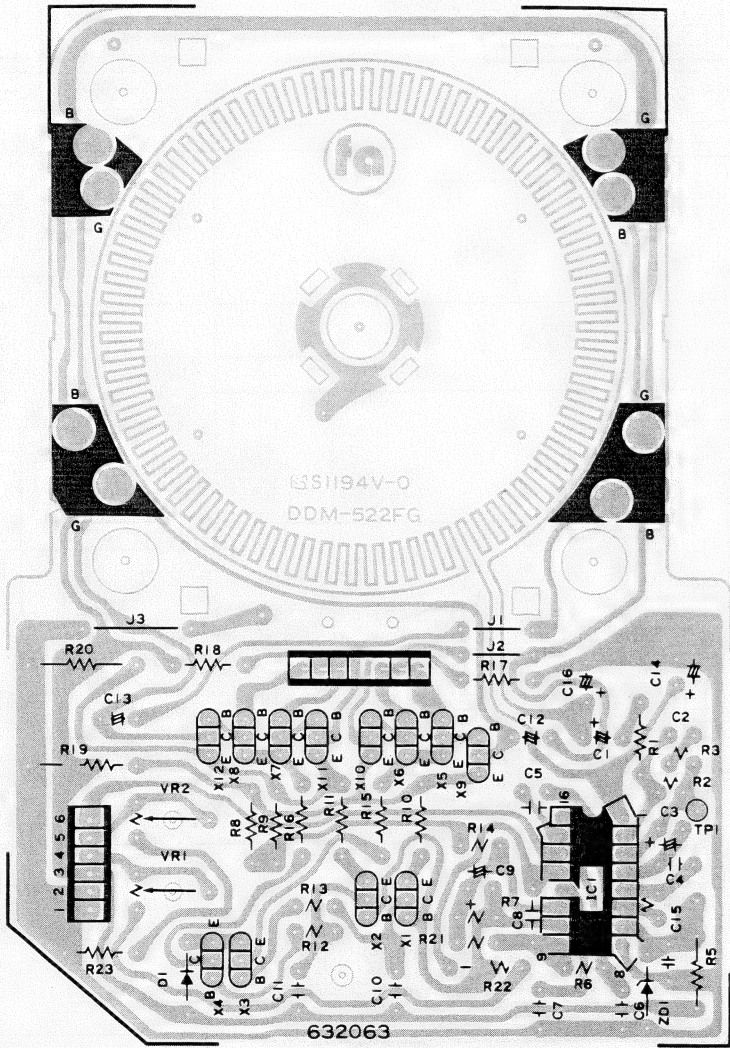
Symptom	Cause	Procedure
<p><b>Motor</b></p> <p>a) Direct Drive (Main) Motor does not rotate.</p> <p>b) Direct Drive Motor does not rotate or speed is slow.</p>	<p>a) 1. Motor is defective.</p> <p>2. Transistor X108, X109 of Main Control circuit PCB is defective.</p> <p>3. Position Sensor Ass'y or IC 102 is defective.</p> <p>b) 1. Transformer or Rectifying circuit is defective.</p> <p>2. Hall Element is defective.</p>	<p>a) 1. Disconnect terminal 6 of CNP 102. If motor does not start rotation, replace Motor.</p> <p>2. Check voltage between terminals TP7 and 16 of IC 102. If 5V DC is observed, replace X108, X109.</p> <p>3. Check as specified in Item b) 1. of Play/Cut. If Position Sensor Ass'y is OK, replace IC 102.</p> <p>b) 1. Check voltage between 3 and 2 of CNP 1 of Motor Control Circuit PCB. If 22V is not observed, replace Transformer or Rectifying circuit.</p> <p>2. Check waveform of base signal of X5, X6, X7 and X8. Waveform should be</p>  <p>If not, hall element is defective, replace Motor Control Circuit PCB.</p>

Symptom	Cause	Procedure
<b>Motor (continued)</b>		
b) Direct Drive Motor does not rotate or speed is slow. (continued)	b) 3. Transistor X9, X10, X11, X12, or X5, X6, X7, X8 is defective.	b) 3. Check waveform of collector signal of X9, X10, X11, X12. Waveform should be  If above waveform is not observed, check transistors X5, X6, X7, X8, X9, X10, X11, and X12, and replace defective one.
c) Direct Drive Motor does not rotate.	c) 1. Direct Drive Motor is defective.  2. IC 1 of Motor Control Circuit PCB is defective.	c) 1. Check resistance of Motor Winding Wire. (between G and G, B and B) Infinite resistance: Broken wire 0 resistance: Shorted wire 105 ohm (approx): Normal. 2. Check voltage between terminals GND and 10 of IC 1. If 0.6V is not observed, replace IC 1.
d) Motor runs, but speed is high.	d) 1. Zenor Diode (ZD 1) is defective.  2. Semi-fixed resistor (VR1 or VR2) or external Potentiometer is defective, or improper wiring.	d) 1. Check voltage between terminals GND and 7 of IC 1. If 13V DC is observed, normal. 13V DC is observed, normal. 2. Disconnect lead wires between terminals 4 and 5 of CNP 1 of Motor Control Circuit PCB, then reconnect 4 and 5. If Motor Speed cannot be adjusted by VR1 or VR2, replace defective one. Reconnect lead wires to terminals 4 and 5. If Motor speed can be adjusted by external Potentiometer. Replace Potentiometer, or check wiring of Speed Change Switch.

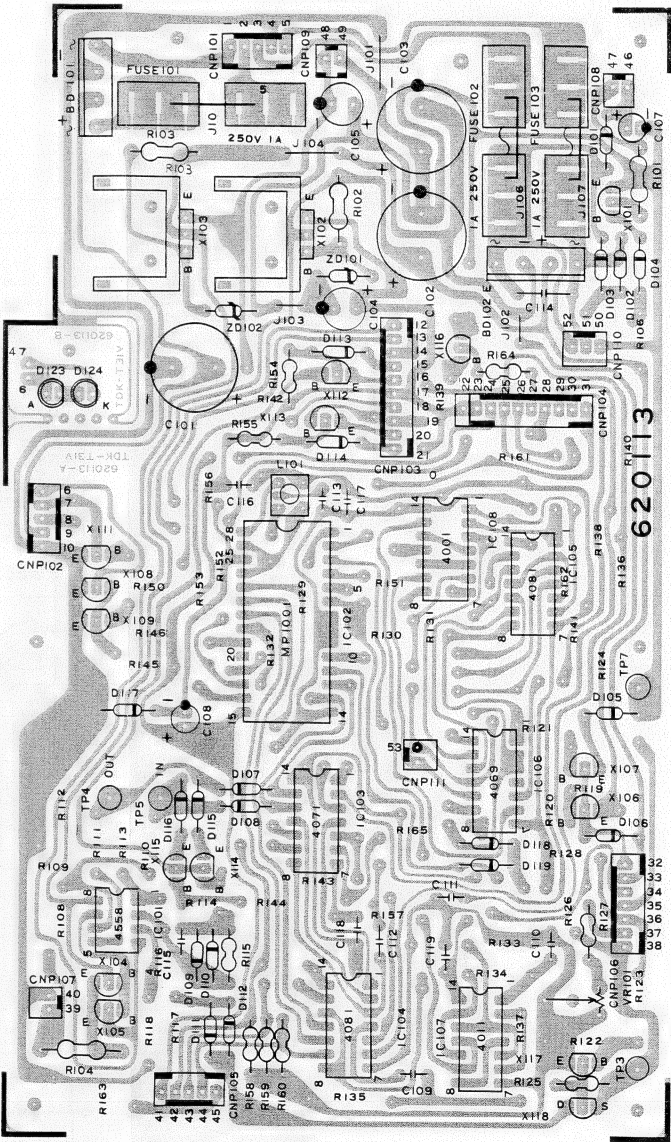
Symptom	Cause	Procedure
<b>Motor (continued)</b>  d) Motor runs (Motor speed is high) (continued)	d) 3. IC 1 is defective.  4. FG pattern is defective, or IC 1 is defective.	d) 3. Touch and release Direct Drive Motor Shaft with hand alternately while monitoring voltage between terminals GND and 10 of IC 1. If voltage does not fluctuate, replace IC 1. 4. Check voltage between terminals GND and 3 of IC 1. Waveform should be  If this waveform is not observed, FG pattern or IC 1 is defective; replace IC 1 or Direct Drive Motor Control circuit PCB.
e) Motor Speed Change does not function.	e) Semi-fixed resistor (VR1 or VR2) or external Potentiometer is defective, or improper wiring.	c) Check as specified in item d) 2 Motor.
f) Direct Drive Motor does not stop rotation after Tonearm returns to the rest position.	f) 1. Direct Drive Motor is defective.  2. Transistor (X108 or X109) is defective.  3. Position Sensor Ass'y or IC 102 is defective.	d) 1. Connect terminals TP7 and 6 of CNP 102 of Main Control Circuit PCB. If Motor does not stop rotation, replace Motor Ass'y. 2. Check voltage between terminals TP7 and 16 of IC 102 of Main Control Circuit PCB. If 0V is observed, replace X108 or X109. 3. Check as specified in item a) 1 of Play/Cut. If Position Sensor is not defective, replace IC 102.



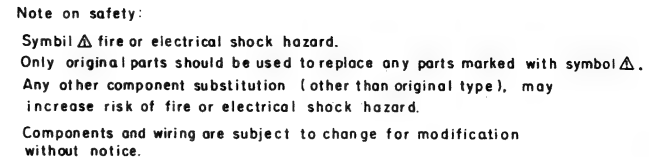
TOP VIEW OF P.C. BOARD  
FOR MAIN MOTOR CONTROL PCB ASS'Y



BOTTOM VIEW OF P.C. BOARD AND WIRING  
Main Contol P.C. Board Ass'y



X





X



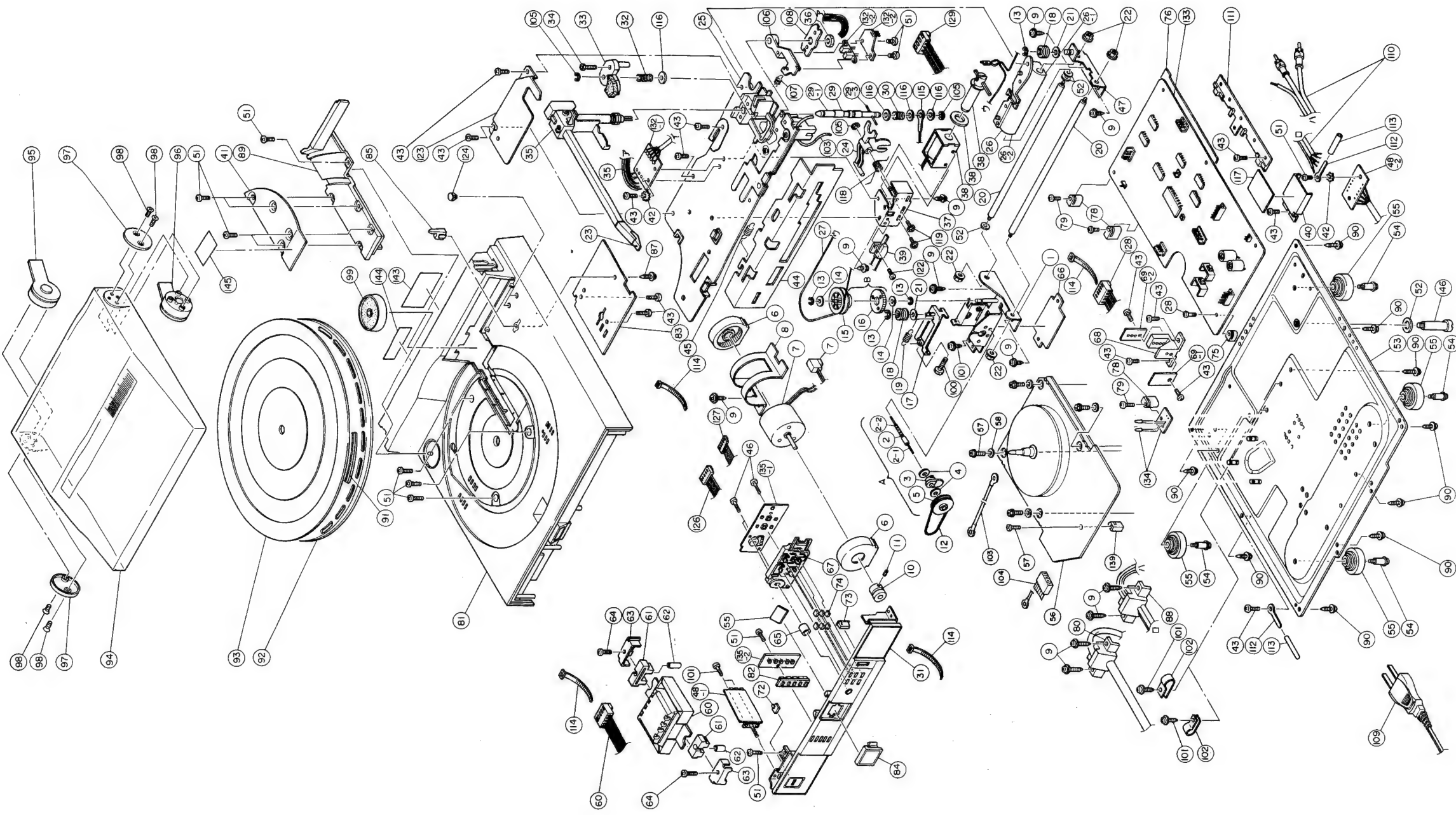
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EXPLODED VIEW



## PARTS LIST

REF. DESIG.	PART NO.	QUANTITY				DESCRIPTION
		E	N	T	A	
P100	620.1110.nec	1	1	1	1	<b>P100-CONTROL CIRCUIT BOARD</b>
133	632.173-1.nec	1	1	1	1	P.W.Board, Control [
						P.W.Board Assembly
						<b>P100-CAPACITORS</b>
C101	△ Z40.8021.2ne	1	1	1	1	Elect 470μF 25V
C102	△ Z40.8031.5ne	1	1	1	1	Elect 1000μF 25V
C103	Z40.8031.5ne	1	1	1	1	Elect 1000μF 25V
C104	Z40.8020.7ne	1	1	1	1	Elect 100μF 16V
C105	Z40.8020.7ne	1	1	1	1	Elect 100μF 16V
C107	Z40.8030.7ne	1	1	1	1	Elect 47μF 25V
C108	Z40.8050.5ne	1	1	1	1	Elect 1μF 50V
C109	Z40.8382.5ne	1	1	1	1	Ceramic 0.01μF
C110	Z40.8382.5ne	1	1	1	1	Ceramic 0.01μF
C111	Z40.8382.5ne	1	1	1	1	Ceramic 0.01μF
C112	Z40.8383.3ne	1	1	1	1	Ceramic 0.047μF
C113	Z40.8210.9ne	1	1	1	1	Film 0.0047μF ±10%
C114	Z40.8383.7ne	1	1	1	1	Ceramic 0.1μF
C115	Z40.8382.5ne	1	1	1	1	Ceramic 0.01μF
C116	Z40.8382.5ne	1	1	1	1	Ceramic 0.01μF
C117	Z40.8382.5ne	1	1	1	1	Ceramic 0.01μF
C118	Z40.8382.5ne	1	1	1	1	Ceramic 0.01μF
C119	Z40.8382.5ne	1	1	1	1	Ceramic 0.01μF
						<b>P100-RESISTORS</b>
						(All Resistors are ±5% & 1/4W)
R101	Z40.5806.4ne	1	1	1	1	220Ω 1/2W
R102	Z40.5800.5ne	1	1	1	1	680Ω 1/2W
R103	Z40.5800.5ne	1	1	1	1	680Ω 1/2W
R104	△ Z40.5401.8ne	1	1	1	1	27Ω 1W
R115	Z40.5055.1ne	1	1	1	1	1.8MΩ
R125	Z40.5055.1ne	1	1	1	1	1.8MΩ
R127	Z40.5046.3ne	1	1	1	1	390Ω
R154	Z40.5045.7ne	1	1	1	1	220Ω
R155	Z40.5045.7ne	1	1	1	1	220Ω
R158	Z40.5055.1ne	1	1	1	1	1.8MΩ
R159	Z40.5055.1ne	1	1	1	1	1.8MΩ
R160	Z40.5055.1ne	1	1	1	1	1.8MΩ

REF. DESIG.	PART NO.	QUANTITY				DESCRIPTION
		E	N	T	A	
R164	Z40.5045.7ne	1	1	1	1	220Ω
VR101	704.825-8.nec	1	1	1	1	10kΩ Trimming
VR102	704.825-1.1ne	1	1	1	1	50kΩ Trimming, 33rpm
VR103	704.825-9.nec	1	1	1	1	20kΩ Trimming, 45rpm
						<b>P100-SEMICONDUCTORS</b>
IC101	Z41.2003.03n	1	1	1	1	I.C, NJM45-1D
IC102	632.0000.nec	1	1	1	1	I.C, MP1001
IC103	Z41.2006.31n	1	1	1	1	I.C, μPD4071BC
IC104	Z41.2006.51n	1	1	1	1	I.C, MC14081B
IC105	Z41.2006.51n	1	1	1	1	I.C, MC14081B
IC106	Z41.2006.9ne	1	1	1	1	I.C, TC4069UBP
IC107	Z41.2006.7ne	1	1	1	1	I.C, CD4011BE
IC108	Z41.2005.9ne	1	1	1	1	I.C, LC4001B
X101	Z41.0410.2ne	1	1	1	1	Transistor 2SC945 (P), (Q)
X102	△ Z41.0613.3ne	1	1	1	1	Transistor 2SD882 (P), (Q)
X103	△ Z41.0207.2ne	1	1	1	1	Transistor 2SB772 (E), (P), (Q)
X104	△ Z41.0607.3ne	1	1	1	1	Transistor 2SD667 (C), (D)
X105	△ Z41.0204.3ne	1	1	1	1	Transistor 2SB647 (C), (D)
X106	△ Z41.0607.3ne	1	1	1	1	Transistor 2SD667 (D)
X107	△ Z41.0607.3ne	1	1	1	1	Transistor 2SD667 (D)
X108	Z41.0410.2ne	1	1	1	1	Transistor 2SC945 (P), (Q)
X109	Z41.0410.2ne	1	1	1	1	Transistor 2SC945 (P), (Q)
X110	△ Z41.0010.2ne	1	1	1	1	Transistor 2SA732 (P), (Q)
X111	Z41.0410.2ne	1	1	1	1	Transistor 2SC945 (P), (Q)
X112	Z41.0410.2ne	1	1	1	1	Transistor 2SC945 (P), (Q)
X113	Z41.0410.2ne	1	1	1	1	Transistor 2SC945 (P), (Q)
X114	Z41.0410.2ne	1	1	1	1	Transistor 2SC945 (P), (Q)
X115	Z41.0410.2ne	1	1	1	1	Transistor 2SC945 (P), (Q)
X116	Z41.0410.2ne	1	1	1	1	Transistor 2SC945 (P), (Q)
X117	Z41.0410.2ne	1	1	1	1	Transistor 2SC945 (P), (Q)
X118	Z41.0801.2ne	1	1	1	1	F.E.T. 2SK68 (K), (L)
X119	Z41.0804.3ne	1	1	1	1	F.E.T. 2SK336
BD101	△ Z41.1004.1ne	1	1	1	1	Diode, S1VB10
BD102	△ Z41.1003.1ne	1	1	1	1	Diode, RB-151
D101	△ Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D102	△ Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D103	△ Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D104	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D105	△ Z41.1001.3ne	1	1	1	1	Diode, F14C

REF. DESIG.	PART NO.	QUANTITY				DESCRIPTION
		E	N	T	A	
D106	Z41.1001.3ne	1	1	1	1	Diode, F14C
D107	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D108	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D109	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D110	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D111	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D112	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D113	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D114	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D115	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D116	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D117	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D118	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D119	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D120	Z41.1010.1ne	1	1	1	1	Diode, 1SS53
D121	Z41.1001.3ne	1	1	1	1	Diode, F14C
ZD101	Z41.1260.1ne	1	1	1	1	Zener, HZ6LA-3
ZD102	Z41.1260.1ne	1	1	1	1	Zenr, HZ6LA-3
<b>P100-MISCELLANEOUS</b>						
CNP101	896.351-5.nec	1	1	1	1	Plug, (5P)
CNP102	706.033-4.nec	1	1	1	1	Plug, (4P)
CNP102	706.033-5.nec	1	1	1	1	Plug, (5P)
CNP103	706.033-1.0ne	1	1	1	1	Plug, (10P)
CNP104	706.033-9.nec	1	1	1	1	Plug, (9P)
CNP105	706.033-5.nec	1	1	1	1	Plug, (5P)
CNP106	706.033-7.nec	1	1	1	1	Plug, (7P)
CNP107	896.351-2.nec	1	1	1	1	Plug, (2P)
CNP108	706.033-2.nec	1	1	1	1	Plug, (2P)
FUSE Δ 102	Z42.0001.0ne	1	1	1	1	Fuse, 1A 250V
FUSE Δ 103	Z42.0001.0ne	1	1	1	1	Fuse, 1A 250V
L101	706.2950.nec	1	1	1	1	OSC Transf.
JK1	893.395-1.nec	1	1	1	1	Jack, Fuse Holder
JK2	893.395-1.nec	1	1	1	1	Jack, Fuse Holder
JK3	893.395-1.nec	1	1	1	1	Jack, Fuse Holder
JK4	893.395-1.nec	1	1	1	1	Jack, Fuse Holder
501	911.3810.nec	1	1	1	1	Heat Sint
502	Y10.3008.03n	1	1	1	1	P. Tapt Screw, P3X8

REF. DESIG.	PART NO.	QUANTITY				DESCRIPTION
		E	N	T	A	
<b>PA00 POWER SWITCH CIRCUIT BOARD</b>						
PA00 Δ	911.593-A.nec	1	1	1	1	P.W. Board, Power Switch
48-1 Δ	873.501-A.nec	1	1	1	1	P.W. Board Assembly
C201	Z40.8600.5ne	1	1	1	1	Ceramic 0.01μF 400V
SW201Δ	910.673-1.nec	1	1	1	1	Push Switch, Power
109 Δ	890.208-2.nec	1	1	1	1	A.C. Power Cord
<b>PA50 PHONO OUTPUT-1 CIRCUIT BOARD</b>						
PA50	911.593-B.nec	1	1	1	1	P.W. Board, Phono Output-1
48-2	873.501-B.nec	1	1	1	1	P.W. Board Assembly
110	870.7710.nec	1	1	1	1	Connective Cord, Output
<b>PB50 SENSOR-2 CIRCUIT BOARD</b>						
PB50	911.605-B.nec	1	1	1	1	P.W. Board, Sensor-2
69-1	911.658-B.nec	1	1	1	1	P.W. Board Assembly
<b>PB00 SENSOR-1 CIRCUIT BOARD</b>						
PB00	911.605-A.nec	1	1	1	1	P.W. Board, Sensor-1
69-2	911.658-A.nec	1	1	1	1	P.W. Board Assembly
128	911.6310.nec	1	1	1	1	Connective Cord
<b>Note:</b> To be supplied not one Part but as a pair of P.W.B. ass'y NO. 911.658B.nec and P.W.P. Kit ass'y 911.6580.nec for LED and photographic transistors of PB00 and PB50 circuit board which characteristics are strictly chosen. Do not mixed up with parts of other circuit board because all parts are used as a pair.						
<b>PC00 PHONO OUTPUT-2 CIRCUIT BOARD</b>						
PC00	911.606-B.nec	1	1	1	1	P.W. Board, Phono Output-2
132-1	911.664-B.nec	1	1	1	1	P.W. Board Assembly
<b>PC50 TRACKING SENSOR CIRCUIT BOARD</b>						
PC50	911.606-A.nec	1	1	1	1	P.W. Board, Tracking Sensor
132-2	911.664-A.nec	1	1	1	1	P.W. Board Assembly

REF. DESIG.	PART NO.	QUANTITY				DESCRIPTION
		E	N	T	A	
129	911.6320.nec	1	1	1	1	Connective Cord  <b>Note:</b> To be supplied not one part but as P.W.B. Kit ass'y NO. 911.6640. nec FA for photographic transistors of PC50 circuit board. Do not mix up with parts of other circuit board because parts of the transistors are used as a pair.
						<b>P200-1 STROBE L.E.D. CIRCUIT BOARD</b>
P200	912.5100.nec	1	1	1	1	P.W. Board, Strobe L.E.D.
134	912.5990.nec	1	1	1	1	P.W. Board Assembly
D123	899.9080.nec	1	1	1	1	L.E.D. AA-5534S
D124	899.9080.nec	1	1	1	1	L.E.D. AA-5534S
131	912.5980.nec	1	1	1	1	Connective Cord  <b>PD00-FUNCTION SWITCH CIRCUIT BOARD</b>
PD00	873.466-1.nec	1	1	1	1	P.W. Board, Function SW.
135-1	873.495-A.nec	1	1	1	1	P.W. Board Assembly
VR201	911.386-3.nec	1	1	1	1	5k $\Omega$ (B) Variable Resistor, Pitch
SW202	912.5950.nec	1	1	1	1	Push Switch
SW203	912.5950.nec	1	1	1	1	Push Switch
SW204	912.5950.nec	1	1	1	1	Push Switch
SW205	912.5950.nec	1	1	1	1	Push Switch
SW206	912.5950.nec	1	1	1	1	Push Switch
SW207	911.5520.nec	1	1	1	1	Push Switch
SW208	911.5520.nec	1	1	1	1	Push Switch
127	912.5970.nec	1	1	1	1	Connective Cord  <b>PD50-FUNCTION L.E.D. CIRCUIT BOARD</b>
PD50	873.466-2.nec	1	1	1	1	P.W. Board, Function L.E.D.
135-2	873.495-B.nec	1	1	1	1	P.W. Board Assembly
D201	897.8240.nec	1	1	1	1	L.E.D. GL-9PR2
D202	912.0310.nec	1	1	1	1	L.E.D. GL-9NG2
D203	912.0310.nec	1	1	1	1	L.E.D. GL-9NG2
D204	912.0310.nec	1	1	1	1	L.E.D. GL-9NG2

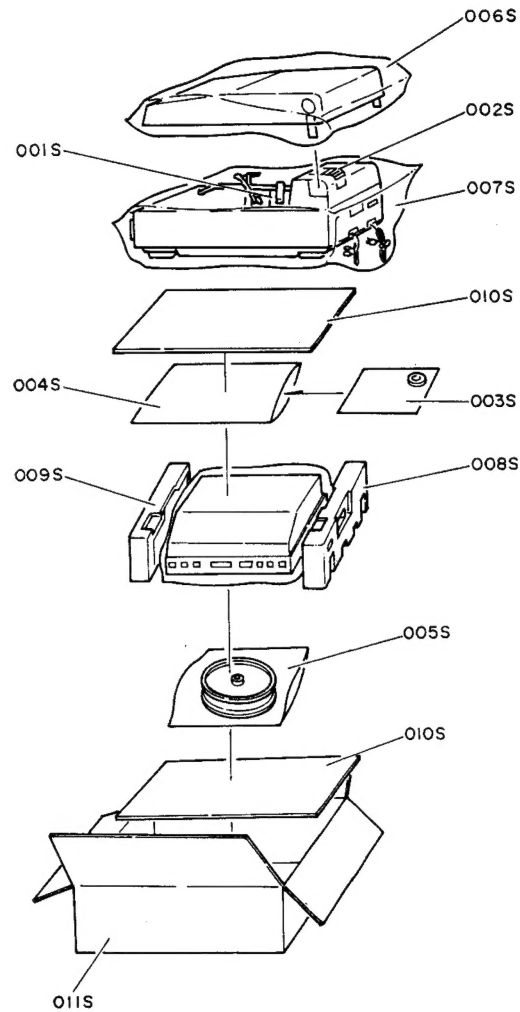
REF. DESIG.	PART NO.	QUANTITY				DESCRIPTION
		E	N	T	A	
D205	897.8240.nec	1	1	1	1	L.E.D. GL-9PR2
126	912.5960.nec	1	1	1	1	Connective Cord
1	911.619-1.nec	1	1	1	1	Bracket Assembly, Tone Arm
A		1	1	1	1	Gear Assembly, Worm
2	911.5970.nec	1	1	1	1	Gear, Worm
3	897.6750.nec	1	1	1	1	Sustainer
4	021.0405.nec	1	1	1	1	Washer, Polyslider $\phi 2.1 \times \phi 4 \times t 0.5$
5	897.6770.nec					Pulley, Worm
6	873.145-1.nec	1	1	1	1	Buffer
7	706.2010.nec	1	1	1	1	DC Motor, Tone Arm Drive
8	911.3540.nec	1	1	1	1	Clamper, Motor
9	3x6.TPT0.nec	1	1	1	1	Cup Tite Screw $\phi 3 \times 6$
10	897.8130.nec	1	1	1	1	Pulley, Motor
11	2x3.TPT0.nec	1	1	1	1	Set Screw, M2x3
12	911.5980.nec	1	1	1	1	Belt, Worm
13	03E.0000.nec	10	10	10	10	R.G. Ring, E Type $\phi 3$
14	046.1005.nec	2	2	2	2	Washer, Polyslider $\phi 4.6 \times \phi 10 \times t 0.5$
B	911.599-1.nec	1	1	1	1	Gear Assembly, Worm Wheel
15	911.328-1.nec	1	1	1	1	Pulley, Drum
16	911.3270.nec	1	1	1	1	Gear, Drum
17	911.6000.nec	1	1	1	1	Bracket Assembly, Pulley
18	911.3290.nec	2	2	2	2	Pulley, Wire Rope
19	911.6010.nec	1	1	1	1	Spring
20	911.6030.nec	2	2	2	2	Guide
21	04x805.nec	2	2	2	2	Washer, Polyslider $\phi 4 \times \phi 8 \times t 0.5$
22	M30.0000.nec	4	4	4	4	Flange Nut M3
23	912.7280.nec	1	1	1	1	Stylus, CT-520 N1510F
24	911.3330.nec	1	1	1	1	Lever, Lifter
25	848.6020.nec	1	1	1	1	Chassis, PU Base
26	911.6720.nec	1	1	1	1	Guide Assembly
27	911.5150.nec	1	1	1	1	String Assembly, Wire Rope
28	3x16.BT0.nec	1	1	1	1	P.H.B. Tite Screw P3x10
29	911.6070.nec	1	1	1	1	Shaft Assembly, Lifter
29-1	911.3350.nec	1	1	1	1	Shaft, Lifter
30	910.0730.nec	1	1	1	1	Spring, Lifter
31	852.7280.nec	1	1	1	1	Escutcheon, Front Gold
32	911.4350.nec	1	1	1	1	Spring, Lifter
33	911.3340.nec	1	1	1	1	Retainer
34	912.2150.nec	1	1	1	1	Screw, M2.6x15
35	852.7300.nec	1	1	1	1	Tone Arm, Gold (with Stylus)

REF. DESIG.	PART NO.	QUANTITY				DESCRIPTION
		E	N	T	A	
36	M10.0000.nec	1	1	1	1	Nut, PU M10
37	911.6110.nec	1	1	1	1	Bracket Assembly, Solenoid
38	△ 911.6120.nec					Solenoid Coil
39	899.9960.nec	1	1	1	1	Mini Switch Up/Down
40	911.5540.nec	1	1	1	1	Shield
41	873.5320.nec	2	2	2	2	Shield, Cabi Cover
42	TOW.3000.nec	2	2	2	2	T.L. Washer, OR TOW3
43	3x6.BT00.nec	13	13	13	13	P.H.B. Tite Screw P3x6
44	911.3560.nec	1	1	1	1	Sifter
45	911.6130.nec	1	1	1	1	Spring, Sifter
46	312.BT00.nec	3	3	3	3	P.H.B. Tite Screw P3x12
47	911.6150.nec	1	1	1	1	Bracket Assembly, Guide
48		1	1	1	1	P.W.B Circuit Boord
51	3x8.BT00.nec	17	17	17	17	P.H.B. Tite Screw P3x8
52	911.6460.nec	4	4	4	4	Buffer, Guide
53	852.767-1.nec	1	1	1	1	Chassis Assembly, Main
54	911.6340.nec	4	4	4	4	Screw
55	911.5200.nec	4	4	4	4	Leg
56	△ 632.2160.nec	1	1	1	1	Phono Motor
57	912.6180.nec	1	1	1	1	Sustainer Assembly, T.T. Shaft
58	912.6500.nec	1	1	1	1	Spindle
59	910.8310.nec	1	1	1	1	Pin, Spindle
60	△ 873.6010.nec	1	1	1	1	Power Transformer
60	△ 873.6000.nec	1	1	1	1	Power Transformer
60	△ 873.6440.nec	1	1	1	1	Power Transformer
61	911.3480.nec	2	2	2	2	Buffer, Transformer
62	41x.5311.nec	2	2	2	2	Bush φ4.1xφ5.3xℓ11
63	911.3490.nec	2	2	2	2	Clamper
64	420.CT00.nec	2	2	2	2	C Tite Screw P4x20
65	912.5050.nec	1	1	1	1	Knob, Vol
66	911.3550.nec	1	1	1	1	Buffer
67	873.4840.nec	1	1	1	1	Movement
68	911.3460.nec	1	1	1	1	Holder
72	912.6190.nec	1	1	1	1	Knob, Power Sw.
73	912.5040.nec	1	1	1	1	Button, Play
74	912.5030.nec	6	6	6	6	Button, Operation
75	911.344-1.nec	1	1	1	1	Holder
76	911.9960.nec	1	1	1	1	Protector
78	911.3440.nec	3	3	3	1	Holder
79	320.BT00.nec	3	3	3	3	P.H.B. Tite Screw P3x20

REF. DESIG.	PART NO.	QUANTITY				DESCRIPTION
		E	N	T	A	
80	911.3620.nec	1	1	1	1	Clamper
81	849.0220.nec	1	1	1	1	Case
82	912.5020.nec	1	1	1	1	Cover
83	911.5300.nec	1	1	1	1	Shield, Case
84	873.4650.nec	1	1	1	1	Window
85	912.5060.nec	1	1	1	1	Retainer Gold
86	898.52-40.nec	1	1	1	1	Reflector
87	325.TPT0.nec	1	1	1	1	Cup Tite Screw P3x25
88	912.5940.nec	1	1	1	1	Clamper
89	852.727-1.nec	1	1	1	1	Cover Gold
90	316.TPT0.nec	9	9	9	9	Cup Tite Screw P3x16
91	912.6120.nec	1	1	1	1	Belt, Turn Table
92	620.1090.nec	1	1	1	1	Turn Table
93	873.144-1.nec	1	1	1	1	Sheet
94	852.729-1.nec	1	1	1	1	Dust Cover for Gold
95	911.622-5.nec	1	1	1	1	Hinge Assembly, (L)
96	911.622-6.nec	1	1	1	1	Hinge Assembly, (R)
97		1	1	1	1	Cover, Hinge
97		1	1	1	1	Cover, Hinge
98	266.0000.nec	2	2	2	2	O.C.H. Tap Screw φ2.6x6
98	266.0000.nec	2	2	2	2	O.C.H. Tap Screw φ2.6x6
98	266.0000.nec	2	2	2	2	O.C.H. Tap Screw φ2.6x6
99	890.8760.nec	1	1	1	1	Rec. Adaptor
100	316.FM00.nec	1	1	1	1	H. Head Bolt M3x16
101	3x8.TPT0.nec	5	5	5	5	Cup Tite Screw P3x8
102	911.4660.nec	2	2	2	2	Clamper
105	02E.0000.nec	3	3	3	3	R.G. Ring, E Type φ2
106	911.3510.nec	1	1	1	1	Holder, T Sensor
107	911.6090.nec	1	1	1	1	Spring
108	911.3530.nec	1	1	1	1	Spacer
	870.913-2.nec			1		A.C Power Cord
109	890.208-2.nec	1	1			A.C Power Cord
110	870.7710.nec	1	1	1	1	Connective Cord, Output
111	911.3450.nec	1	1	1	1	Holder, Control P.W. Board
112	890.7550.nec	3	3	3	3	Clamper
113	33L.6000.nec	3	3	3	3	Tube φ3.3xℓ60
114	894.4080.nec	4	4	4	4	Clamper
115	4L0.0000.nec	1	1	1	1	Lug φ4
116	912.1130.nec	4	4	4	4	Washer, Lifter
117		1	1	1	1	Tape, UL. Black

REF. DESIG.	PART NO.	QUANTITY				DESCRIPTION
		E	N	T	A	
118	911.5210.nec	1	1	1	1	Spring
119	3x4.TP00.nec	2	2	2	2	Cup Tite Screw P3x4
122	3x5.FM00.nec	1	1	1	1	P.H.M. Screw P3x5
123	911.5310.nec	1	1	1	1	Shield, Chassis
124	911.6390.nec	2	2	2	2	Bush
126	912.5960.nec	1	1	1	1	Connective Cord
127	912.5970.nec	1	1	1	1	Connective Cord
128	911.6310.nec	1	1	1	1	Connective Cord
129	911.6320.nec	1	1	1	1	Connective Cord
130	912.6210.nec	1	1	1	1	Connective Cord
131	912.5980.nec	1	1	1	1	Connective Cord
133	632.174-1.nec	1	1	1	1	Control Circuit Board Ass'y
136	894.021-5.nec	1	1	1	1	Pulley, Phono Motor -M2x3
138	912.5070.nec	1	1	1	1	Bracket, Phono Motor P2.6x3
140	702.2300.nec	3	3	3	3	Buffer, Phono Motor
141						
142						
143	912.6020.nec	1	1	1	1	Identification Label
144						Serial No. Card
145						Label, Caution for Lock Screw
146	912.6240.nec	1	1	1	1	Screw

## PACKING MATERIALS



REF. DESIG.	PART NO.	QUANTITY				DESCRIPTION
		E	N	T	A	
001S	898.1470.nec	1	1	1	1	Pad., Pick Up
003S	912.6170.nec					Instruction
004S	230.3400.nec	1	1	1	1	Polyethy Bag W230x <sup>2</sup> 340
005S	340.5700.nec	1	1	1	1	Polyethy Bag W340x <sup>2</sup> 570 for TT/TT Sheet
006S		1	1	1	1	Protector, Dust Cover
007S		1	1	1	1	Protector, Unit
	852.7310.nec	1	1	1	1	Cushion Assembly
008S	852.731-R.nec	1	1	1	1	Cushion (R)
009S	852.731-L.nec	1	1	1	1	Cushion (L)
	852.732-1.nec	1	1	1	1	Packing Case Assembly
010S	852.732-1.Bne	2	2	2	2	Reinforcement
011S	852.731-1.Ane	1	1	1	1	Packing Case
	852.732-1.Cne	1	1	1	1	Pad